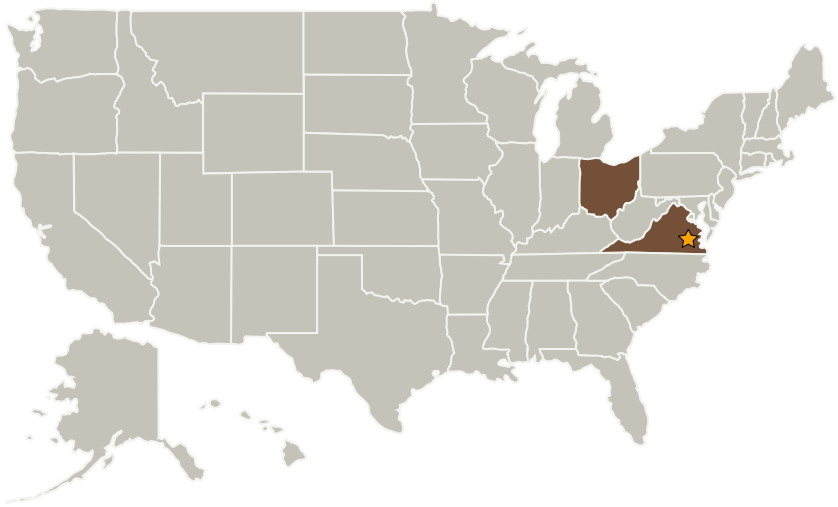
Fast Responding PSP for Rotorcraft Aerodynamic Investigations, Phase II

Completed Technology Project (2009 - 2011)

Project Introduction

The overall objective of the Phase I program was to demonstrate a system for simultaneous measurements of unsteady pressure and model geometry. During the Phase I program, system components were identified, evaluated, and selected and a preliminary system for model deformation and unsteady pressure measurements was demonstrated. This system utilized Porous Polymer fast PSP, lifetime-based detection, and a pulsed Laser for illumination to produce single-shot measurements. During the Phase II program, the basic system will be expanded in several steps. The final goal is to produce a mobile system that can be integrated quickly into a wind tunnel and produce near-real time pressure and deformation data. If an existing VMD system is available, it may be desirable to simply synchronize data acquisition with this system, and therefore, an external control capability is essential. Combining pressure and deformation data quickly, a process we refer to as data fusion, is essential for productive wind tunnel tests. Rapid data fusion will enable understanding of the flow while the model is in the tunnel, and therefore, facilitate quick and accurate decisions as the test evolves. The proposed Phase II system will include tools to facility combination of the PSP data with the model geometry.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Innovative Scientific Solutions, Inc.	Supporting Organization	Industry	Dayton, Ohio

Primary U.S. Work Locations	
Ohio	Virginia

Project Transitions

December 2009: Project Start

December 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.2 Structures
    - TX12.2.4 Tests, Tools and Methods